Engineering Services & Supplies Pty Ltd
Phone 1 800 074446
Visit our Web Site www.esseng.com.au

GUARDABELT IMPACT CRADLE

SAFE WORKING PROCEDURES (SWP)
INSTALLATION MANUAL

MARTIN ENGINEERING

Revision	Description of Change	Changed By	Date
A	Added Final Checklist	AS	28/5/07
B	Updated Melbourne Address & Removed SA Address	SH	3/08/09
C	Final Checklist Updated Items 4 & 5 Reversed	SH	15/04/10
D	Updated Drawing F0055 & F0007	KO	14/03/11

ENGINEERING SERVICES and SUPPLIES

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CUSTOMER SERVICE NUMBER 1800 074446
TOLL FREE FROM ANYWHERE IN AUSTRALIA

WARRANTY NOTE

ESS WARRANTS the **ESS Product** to be free of defects both in materials and workmanship for a period of 12 months from the date of despatch of the product from the **ESS** factory. The warranty given by **ESS** in this regard will extend only to replacing or repairing product shown to be defective.

The warranty also is subject to the following restrictions:

(a) Installation of the product contrary to the instructions contained in the supplied manual will void such warranty absolutely;

(b) The warranty will not extend to any liability for injuries incurred and which result from the use of the product contrary to the instructions in the manual;

(c) Save as prescribed by law, **ESS** will not be liable for any damage sustained by a purchaser or a third party by way of consequential loss arising out of defects in the product.

You are asked to note that **ESS** offers purchasers a service whereby either:

(a) It will install the product and certify the correctness of such installation, or

(b) Certify the correctness or otherwise of the installation of the product by third parties.

This certification service is designed to ensure that you obtain the full benefit of the **ESS** warranty hereby provided. If you would like to take advantage of the installation certification service provided, please contact **ESS** regarding the service.

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ESS ENGINEERING SERVICES AND SUPPLIES PTY LTD
ALL RIGHTS RESERVED

Information contained herein is for use in the operation of the Guardabelt Impact Cradle, purchased from ***ESS*** and cannot be passed on to any other party without express permission, in writing, from ***ESS***.

ESS Despatch Department to complete. Client should retain for warranty.

Purchaser / Client:	
Purchase Order / Contract No.:	
Site:	Despatch Date:
Conveyor No/s.:	
	No. Supplied:
Description / Part Numbers:	
Comments:	

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SECTION 1 - SAFETY

The Guardabelt Impact Cradle is designed to be quickly and easily serviced by appropriate personnel.

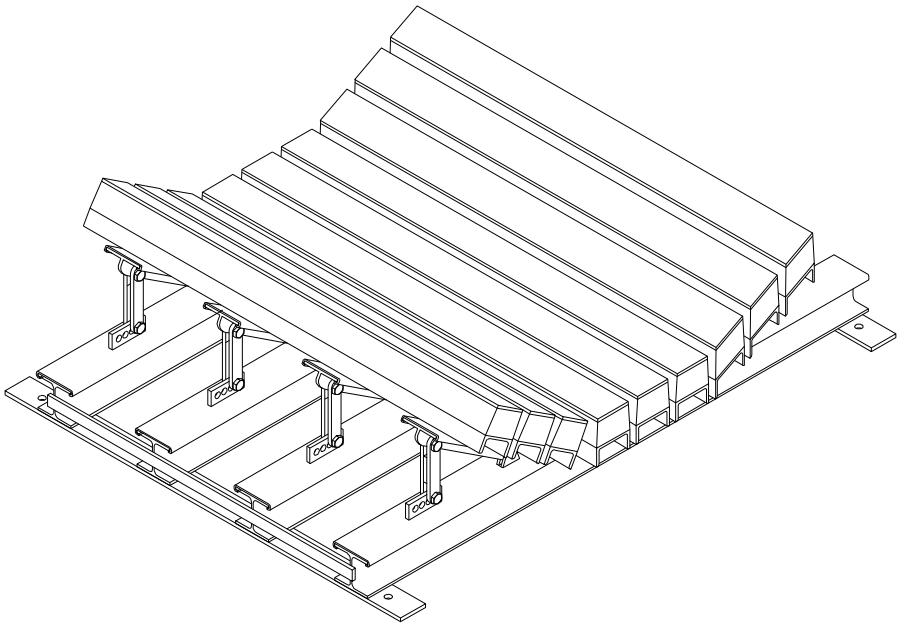
Under no circumstances should servicing or installation of the cleaner be carried out whilst the belt is in operation.

The conveyor must be shut down and locked out before any person enters or reaches into the conveyor enclosure.

Ensure that only suitably qualified and trained personel install and service this product. Ensure that all site and statutory safety procedures are followed.

SECTION 2 - INTRODUCTION

The ***ESS*** Guardabelt Impact Cradle consists of an adjustable steel frame, fitted with impact absorbing rubber bars that are designed to be easily removed without the necessity of pulling out the cradle frame from the conveyor. The bars have a low friction UHMW-Polyethylene top wear surface. The cradle is fabricated to conform exactly to the troughed belt profile.



The ***ESS*** Guardabelt Impact Cradle is designed to replace conventional impact idlers in the load zone of a conveyor.

Under heavy impact loading the Guardabelt bars will easily outlast standard impact idlers, absorb shock loads and increase belt life by reducing material piercing.

In addition to these benefits the Guardabelt impact bars are able to hold the belt flat under the skirting thereby virtually eliminating material spillage.

To achieve these results however, the ***ESS*** Guardabelt Impact Cradle must be installed in the correct manner. Clearances and adjustments which are specified later are essential

to the performance of the cradle. The cradles have been designed and manufactured to simply bolt into place on the conveyor stringers and achieve these clearances from a set of dimensions supplied by the client. The clearances should however be checked at installation to ensure that no fabrication error or design errors have resulted in incorrect installation position of the cradle.

SECTION 3 - INSTALLATION

Handling and Storage Instructions

The ***ESS*** Guardabelt Impact Cradle is a sturdy and robust assembly. It is unlikely to be damaged during normal transport and handling procedures. Each Impact Cradle assembly is despatched individually and is suitable for forklift handling. Average weight, depending on belt width, is of the order of 300-500kg per assembly. The units are suitable for outdoor storage on site.

Installation Procedure

1. Determine approximate installation position for each impact cradle on the conveyor and place the appropriate cradles adjacent to the installation area by use of a forklift, crane etc.

2. Before commencing installation or any work around the conveyor belt ensure that the belt is isolated and tagged.

3. The ***ESS*** Impact Cradle is intended to be installed between impact idler troughing assemblies. Multiple impact cradles will have an impact idler trough assembly between each successive cradle. Ensure that impact idler assemblies are either already installed or available at the installation site. If the idlers are already installed check that sufficient clearance is available between successive sets of rollers to fit an impact cradle. Standard impact cradles are 1200mm long and require 25mm clearance at each end between cradle bar and roller.

   Non standard cradles of 1400mm and 1500mm are also available.

4. Assemble the necessary tools and safety equipment required for the job.

NOTE: BEFORE PROCEEDING WITH INSTALLATION, ENSURE THAT THE CONVEYOR BELT DRIVE IS FULLY ISOLATED AND LOCKED OUT.

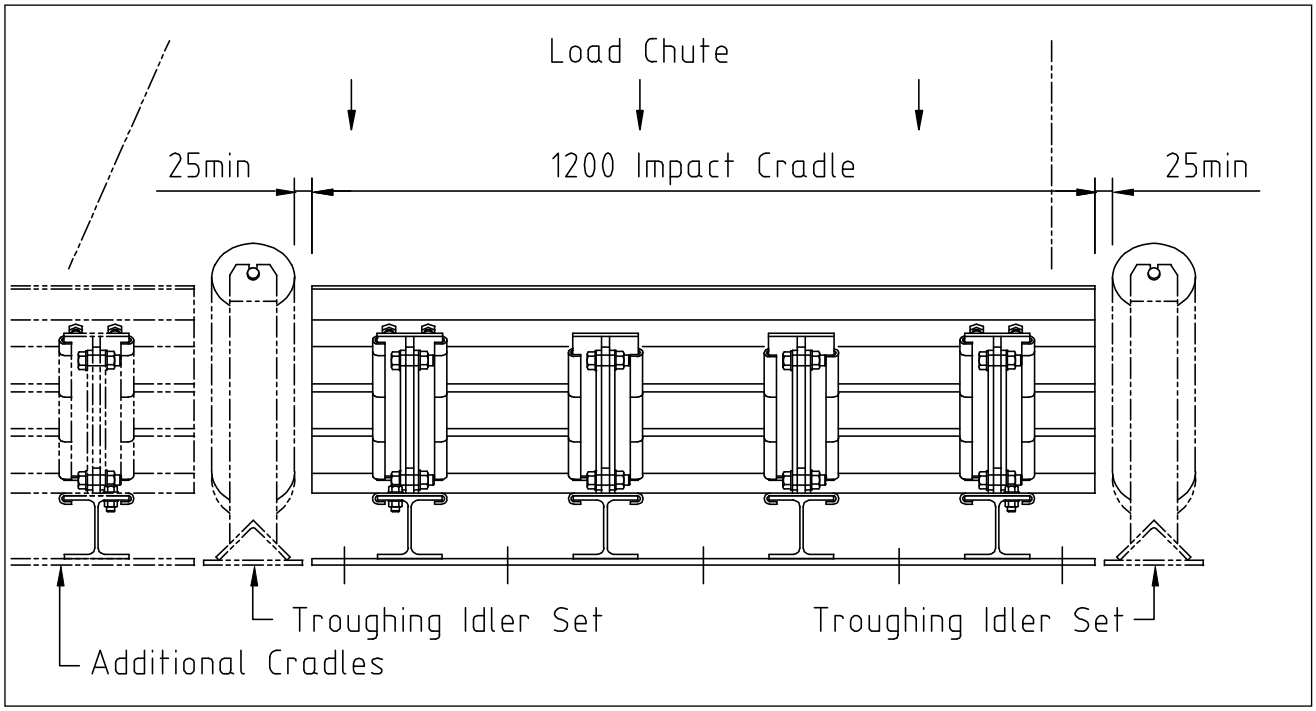


Fig 1. Guardabelt Impact Cradle Layout

5. Determine the installation position for the impact cradle/s. The impact cradle/s should be installed to cover the entire direct load area of the conveyor belt. For a short load zone this may mean one cradle and for longer load zones multiple cradles may be used. Having determined the position of the first impact cradle, disassemble one cradle for installation. This involves removal of the wing locks (two per side) and sliding off the wing bars from both sides. After this is done the four wing support assemblies can be slid from either side of the cradle. The centre bars can then be slid from the cradle base. Insert the cradle base onto the conveyor stringers in the appropriate position and align with stringers. Ensure that the base is centred and squared to the stringers and clamp into position.

NOTE: If the conveyor belt is not already in place, the cradle can be lifted complete into position and installed without disassembly. This would require crane or fork handling.

6. Slide the centre bars onto the base frame and centre them on the base.

7. If not already in position, install an impact idler set either side of the impact cradle base ensuring that 25mm clearance will be available at both ends of the centre impact bars(Fig 1).

8. Using a string line or straight edge ensure that the top of the centre bars is approximately 20mm below the top of the centre rollers of the impact idler frame (Fig 2).

   If this dimension is not approximately 20mm, packing of either the impact cradle base or the impact idler frames may be necessary to achieve this 20mm clearance. Once this clearance is achieved drill bolt holes in the stringers at appropriate position and bolt the cradle base in place. Alternatively, weld in place.

   NOTE: Accelerated bar wear will result from insufficient clearance. Belt damage may result from an excessive clearance - due to lack of belt support.

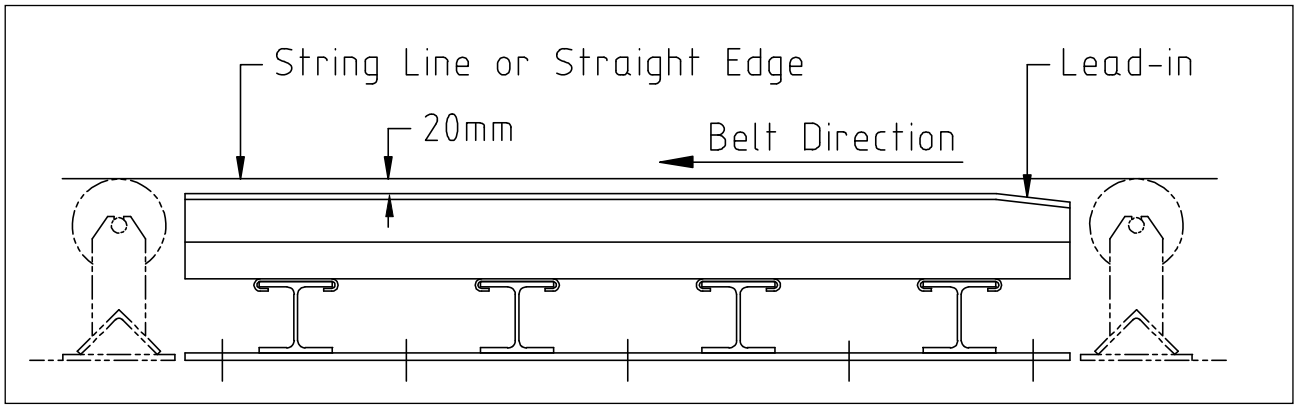


Fig 2. Cradle Positioning

9. Re-assemble the cradle in reverse order of disassembly. The wing bars, that is the troughing bars, should also be approximately 20mm away from the troughing idler line (Fig 3).

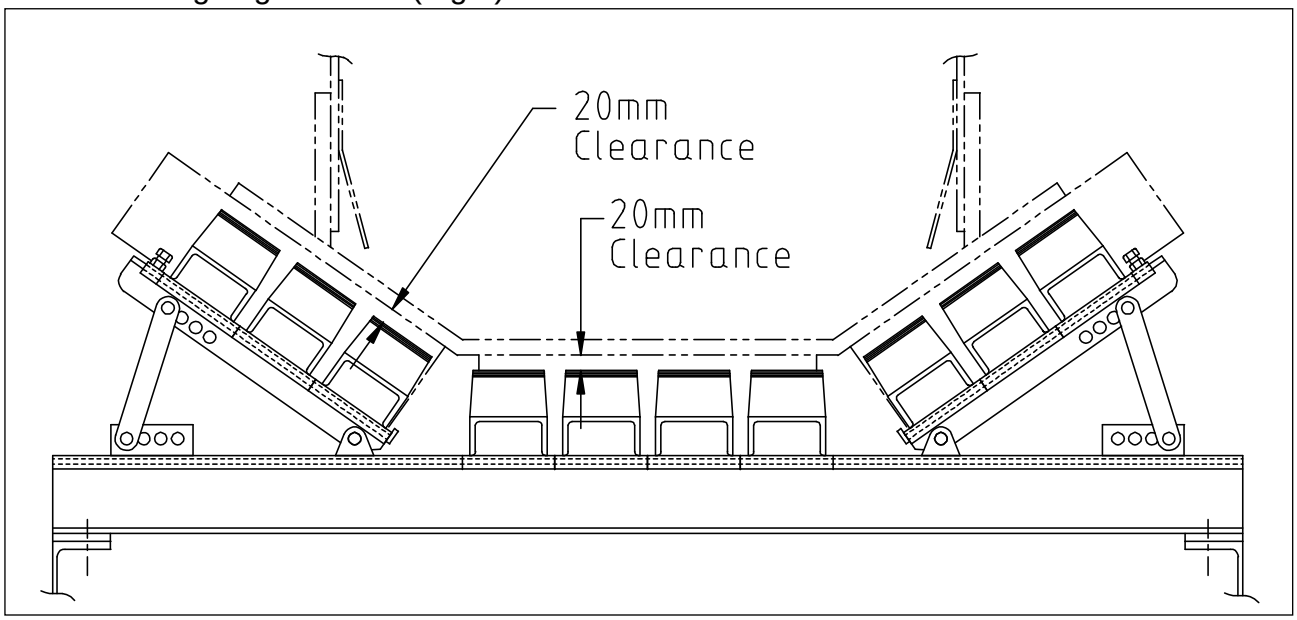


Fig 3. Cradle Setup Clearances

Final adjustment.

10. Using the multiple hole adjustment, adjust the wing support arms so that the outer bar is brought up to be in line with the troughing idler rollers (Fig 4).

    Care should be taken to ensure that the outer bar is as close as possible to the roller line. If the bar is too high, accelerated wear will result. If the bar is too low, the belt may sag, resulting in material spillage.

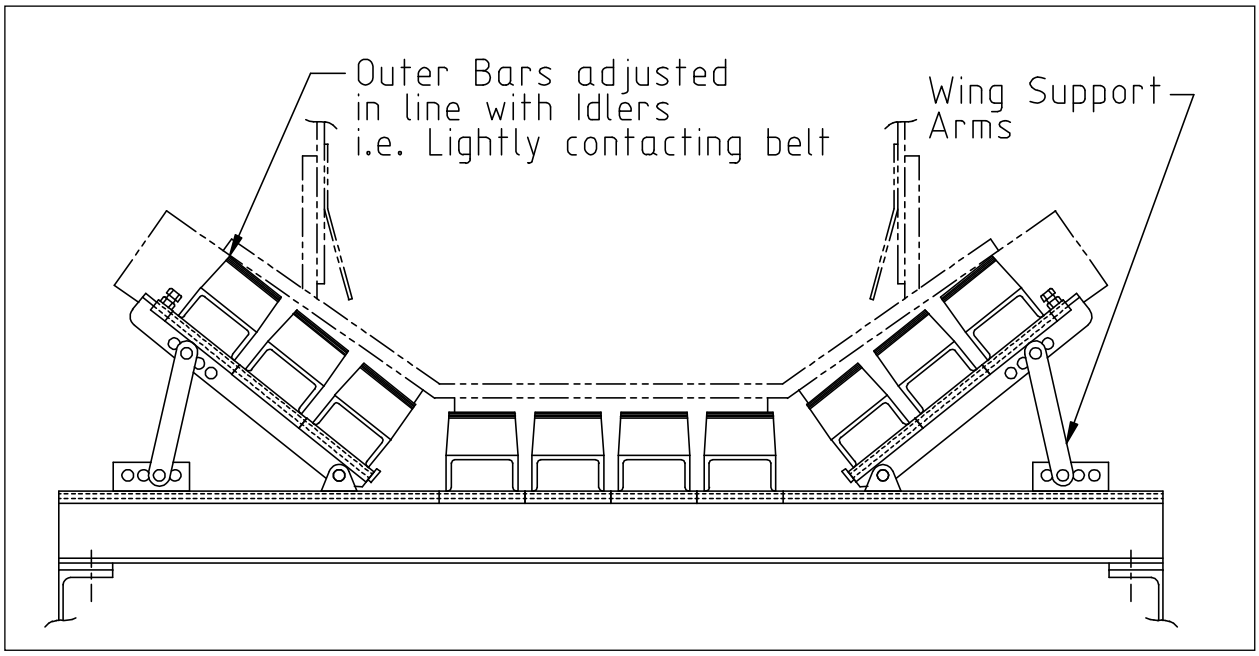


Fig 4. Wing Adjustment

11. Repeat the above procedure for all subsequent cradles.

NOTE: IF YOU HAVE ANY PROBLEMS, OR ARE UNCLEAR ON ANY INSTALLATION STEP, CONTACT *ESS* ON OUR CUSTOMER SERVICE NUMBER 1800 074446.

12. Remove danger tags and return conveyor to service, following plant procedures.

SECTION 4 - COMMISSIONING

No special commissioning procedures are required for Guardabelt impact cradles. Provided the cradles are installed as per the drawing and instructions, then operational attention should not be required.

A note on safety:

No additional safety hazards are present with Guardabelt Impact Cradles other than normal conveyor belt dangers.

In particular:

- Beware of moving conveyor belts.
- Beware of pinch points
- Do not attempt to install, maintain or disassemble any part of a conveyor belt without first isolating and tagging the conveyor drive.

SECTION 5 - OPERATOR TRAINING

Servicing

Recommended dismantle & Hose down and reassemble every 6 months

There are no operator serviceable or adjustable functions on an ***ESS*** Guardabelt Impact Cradle.

No in-service procedures need to be followed, other than normal conveyor belt operating procedures.

Safety

As mentioned in Section 4, no additional safety hazards exist with an ***ESS*** Guardabelt Impact Cradle, other than normal conveyor belt dangers.

- Do not attempt to perform any job on or around a moving conveyor belt - isolate and tag the belt first.

Problems

The operator, during routine conveyor inspections, should be alert to the following problem indicators:

- Smoke or burning rubber smell - the belt should be stopped immediately, and the problem located. It is far more likely to be a siezed impact idler or a skirting problem, but could possibly indicate an impact cradle fault.

- Leakage of material from skirts at load zone - this should be notified to the appropriate maintenance personnel for attention at the earliest plant stoppage. It may mean that skirting requires attention, and/or that the impact cradle wings require adjustment.

SECTION 6 - ROUTINE MAINTENANCE AND SERVICE

Safety

Before attempting any maintenance on or around a conveyor belt, ensure that the belt drive is isolated and tagged.

General

The ***ESS*** Guardabelt Impact Cradle requires virtually no maintenance to operate under extreme conditions for thousands of hours. However, to achieve the best bar life and avoid the need for unscheduled bar change-outs, the following maintenance practices should be adopted.

Routine Maintenance

The cradles should be disassembled (***Cradle Disassembly Procedure*** - page 13) and inspected for bar wear after one month of operation, and again after three months.

Subsequent inspection frequency can be determined after the wear rate is assessed at these initial inspections. The UHMW-Polyethylene top cover of the bar is 8mm thick. The bars should be scheduled for change out when the top cover thickness reaches 2mm.

TIP: During inspection, higher wear areas may be identified on some bars, or sections of bars. This is caused by uneven belt loading in the transfer point. Longer overall bar life may be achieved by noting the position of the bars at disassembly, and rotating the bars to a differeant position on re-assembly, much like rotating the tyres on a car.

Non-Routine Maintenance (Trouble-Shooting)

If the routine maintenance and scheduled bar change-outs are performed as per ***Routine Maintenance***, non routine maintenance should be virtually non existent. However the following situations are possible.

SYMPTOM	POSSIBLE CAUSE	REMEDY
Smoke or burning rubber smell.	1. Siezed idler. 2. Overadjusted or damaged skirting. 3. Worn out impact bar.	- Replace idler - Replace or adjust skirting rubber. - Disassemble impact cradle and replace bars. If bar life is short or wear is uneven, contact ***ESS***.
Material spillage under skirts.	1. Skirting rubber not adjusted or failed. 2. Impact cradle wings not adjusted up to belt.	- Adjust or replace skirting. - Adjust the cradle wings.

Cradle Disassembly Procedure

The disassembly of an ***ESS*** Guardabelt Impact Cradle is a simple process.

1. Remove the slide locks from the outer wing bars (two per side).

2. Remove the securing bolt and nuts holding the wing assembly to the base (two per side).

3. Slide the entire wing assembly out from the belt about 50mm.

4. Slide the individual wing bars from the wing assemblies. Note the bar positions by numbering (with a marking pen or chalk).

5. Slide the wing frame assemblies from the base (four per side).

6. Repeat for the other side.

7. Slide the centre bars of the base (again noting the positions).

8. Inspect the bars for wear or damage. If severe or unusual wear is noted, contact ***ESS*** on **1800 074446** for advice.

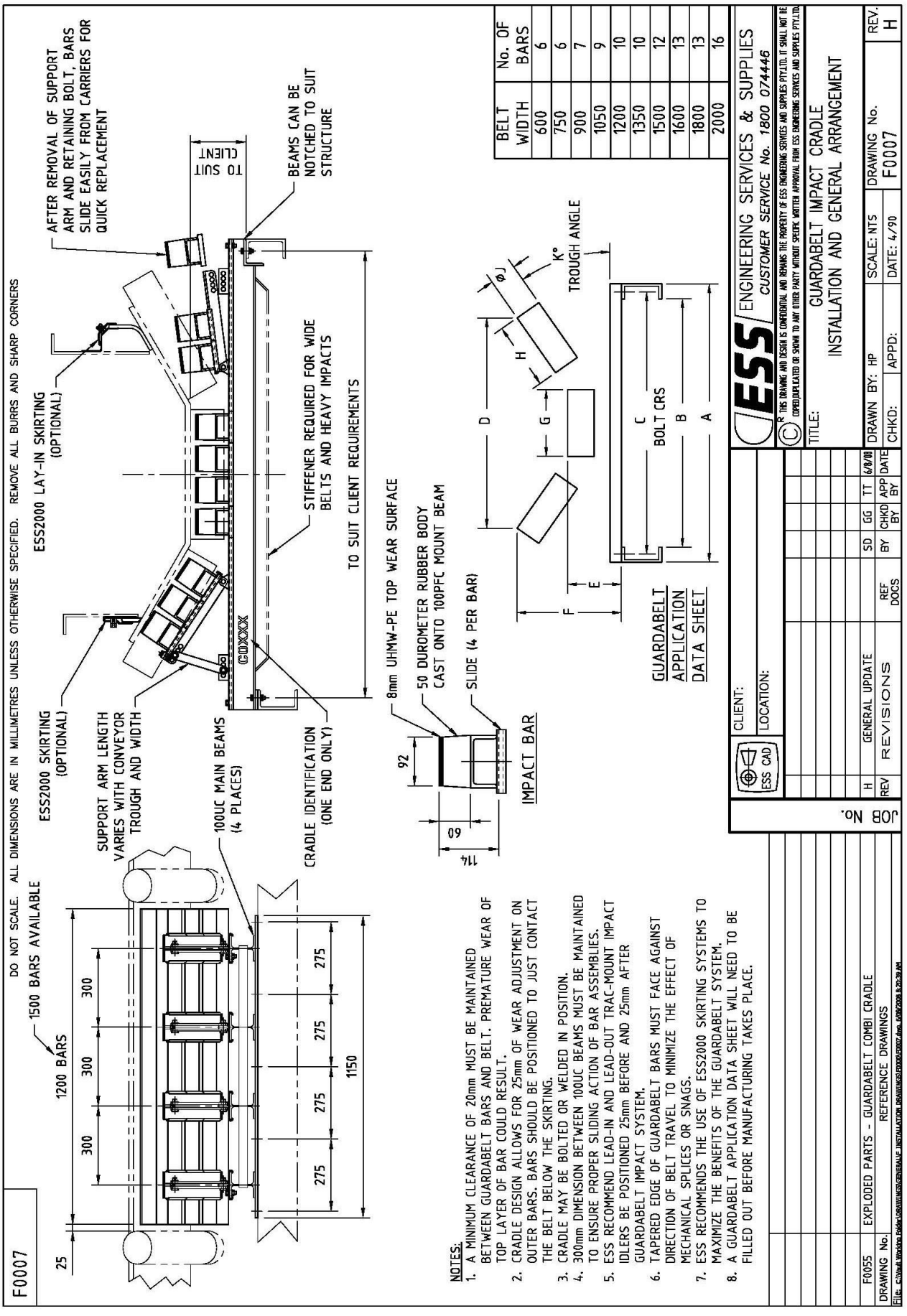
Cradle Re-assembly

Re-assemble the cradle in reverse order of disassembly, paying attention to the following:

- If new bars are being fitted, or if existing bar wear is negligible, refit the bars in any order.

- If wear spots are evident on certain bars, rotate or rearrange bars on re-assembly to maximise total bar life.

SECTION 7 – INSTALLATION ARRANGEMENT DRAWING


F0007
DO NOT SCALE. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED. REMOVE ALL BURRS AND SHARP CORNERS
1500 BARS AVAILABLE
1200 BARS
ESS2000 LAY-IN SKIRTING (OPTIONAL)
ESS2000 SKIRTING (OPTIONAL)
SUPPORT ARM LENGTH VARIES WITH CONVEYOR TROUGH AND WIDTH
100UC MAIN BEAMS (4 PLACES)
CRADLE IDENTIFICATION (ONE END ONLY)
AFTER REMOVAL OF SUPPORT ARM AND RETAINING BOLT, BARS SLIDE EASILY FROM CARRIERS FOR QUICK REPLACEMENT
TO SUIT CLIENT
BEAMS CAN BE NOTCHED TO SUIT STRUCTURE
STIFFENER REQUIRED FOR WIDE BELTS AND HEAVY IMPACTS
TO SUIT CLIENT REQUIREMENTS
8mm UHMW-PE TOP WEAR SURFACE
50 DUROMETER RUBBER BODY CAST ONTO 100PFC MOUNT BEAM
SLIDE (4 PER BAR)
IMPACT BAR
TROUGH ANGLE
BOLT CRS
GUARDABELT APPLICATION DATA SHEET
NOTES:
1. A MINIMUM CLEARANCE OF 20mm MUST BE MAINTAINED BETWEEN GUARDABELT BARS AND BELT. PREMATURE WEAR OF TOP LAYER OF BAR COULD RESULT.
2. CRADLE DESIGN ALLOWS FOR 25mm OF WEAR ADJUSTMENT ON OUTER BARS. BARS SHOULD BE POSITIONED TO JUST CONTACT THE BELT BELOW THE SKIRTING.
3. CRADLE MAY BE BOLTED OR WELDED IN POSITION.
4. 300mm DIMENSION BETWEEN 100UC BEAMS MUST BE MAINTAINED TO ENSURE PROPER SLIDING ACTION OF BAR ASSEMBLIES.
5. ESS RECOMMEND LEAD-IN AND LEAD-OUT TRAC-MOUNT IMPACT IDLERS BE POSITIONED 25mm BEFORE AND 25mm AFTER GUARDABELT IMPACT SYSTEM.
6. TAPERED EDGE OF GUARDABELT BARS MUST FACE AGAINST DIRECTION OF BELT TRAVEL TO MINIMIZE THE EFFECT OF MECHANICAL SPLICES OR SNAGS.
7. ESS RECOMMENDS THE USE OF ESS2000 SKIRTING SYSTEMS TO MAXIMIZE THE BENEFITS OF THE GUARDABELT SYSTEM.
8. A GUARDABELT APPLICATION DATA SHEET WILL NEED TO BE FILLED OUT BEFORE MANUFACTURING TAKES PLACE.
BELT WIDTH / No. OF BARS
600 / 6
750 / 6
900 / 7
1050 / 9
1200 / 10
1350 / 10
1500 / 12
1600 / 13
1800 / 13
2000 / 16
JOB No.
CLIENT:
LOCATION:
ESS CAD
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CUSTOMER SERVICE No. 1800 074446
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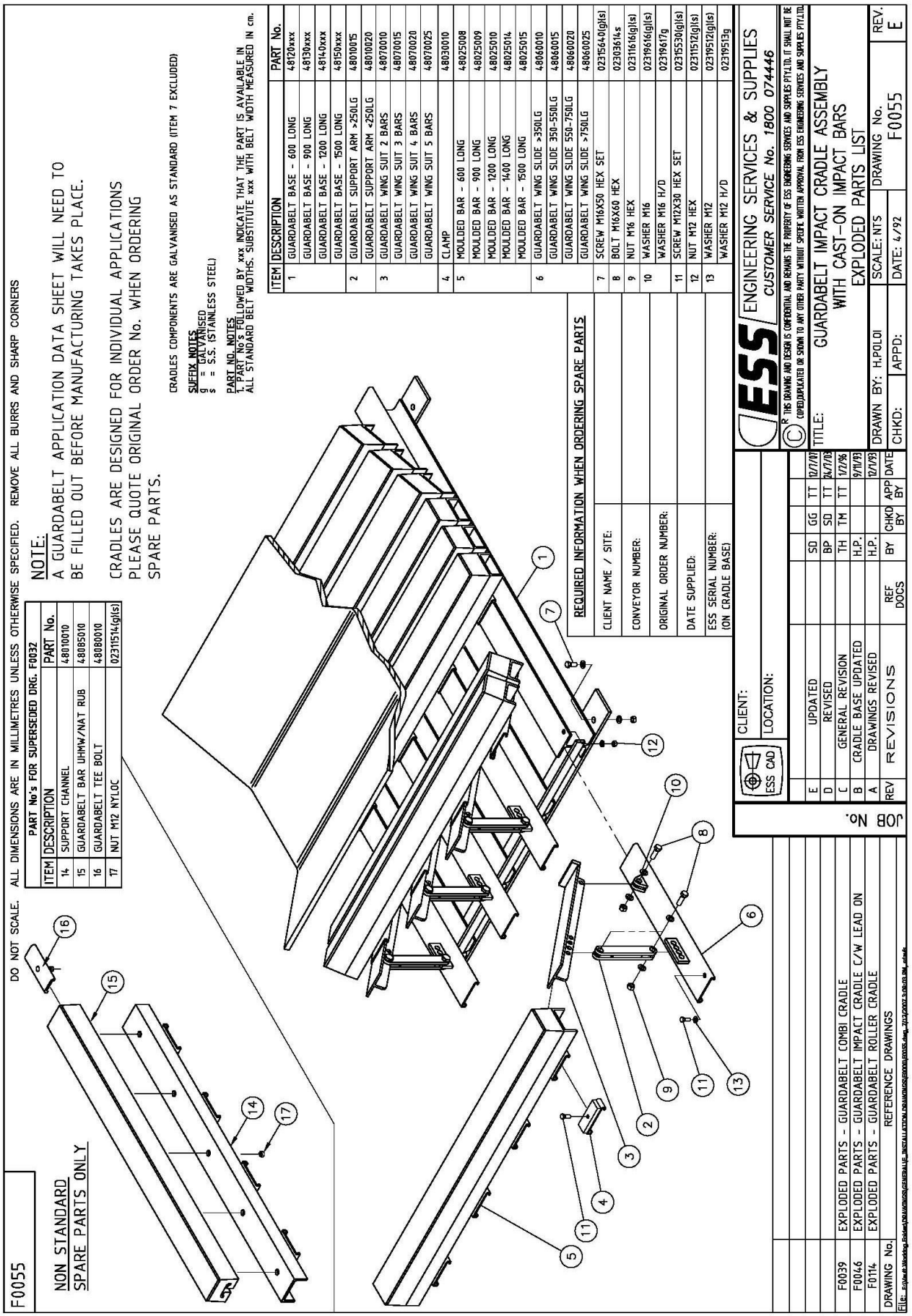
TITLE: GUARDABELT IMPACT CRADLE INSTALLATION AND GENERAL ARRANGEMENT
DRAWN BY: HP
SCALE: NTS
DRAWING No. F0007
REV. H
CHKD:
APPD:
DATE: 4/90
H GENERAL UPDATE SD GG TT 6/8/08
REV REVISIONS BY CHKD BY APP BY DATE
REF DOCS
F0055 EXPLODED PARTS - GUARDABELT COMBI CRADLE
DRAWING No. REFERENCE DRAWINGS
File: C:\Work Files\DRAWINGS\GENERALS\INSTALLATION DRAWINGS\ESS\F0007.dwg, 6/08/2008 8:29:39 AM

SECTION 8 – EXPLODED PARTS DRAWING


F0055
DO NOT SCALE.
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED. REMOVE ALL BURRS AND SHARP CORNERS
NON STANDARD
SPARE PARTS ONLY
PART No's FOR SUPERSEDED DRG. F0032
ITEM DESCRIPTION PART No.
14 SUPPORT CHANNEL 48010010
15 GUARDABELT BAR UHMW/NAT RUB 48085010
16 GUARDABELT TEE BOLT 48080010
17 NUT M12 NYLOC 02311514(gl/ss)
NOTE:
A GUARDABELT APPLICATION DATA SHEET WILL NEED TO BE FILLED OUT BEFORE MANUFACTURING TAKES PLACE.
CRADLES ARE DESIGNED FOR INDIVIDUAL APPLICATIONS PLEASE QUOTE ORIGINAL ORDER No. WHEN ORDERING SPARE PARTS.
CRADLES COMPONENTS ARE GALVANISED AS STANDARD (ITEM 7 EXCLUDED)
SUFFIX NOTES
g = GALVANISED
$ = S.S. (STAINLESS STEEL)
PART NO. NOTES
1. PART No's FOLLOWED BY xxx INDICATE THAT THE PART IS AVAILABLE IN ALL STANDARD BELT WIDTHS. SUBSTITUTE xxx WITH BELT WIDTH MEASURED IN cm.
ITEM DESCRIPTION PART No.
1 GUARDABELT BASE - 600 LONG 48120xxx
GUARDABELT BASE - 900 LONG 48130xxx
GUARDABELT BASE - 1200 LONG 48140xxx
GUARDABELT BASE - 1500 LONG 48150xxx
2 GUARDABELT SUPPORT ARM >250LG 48010015
GUARDABELT SUPPORT ARM <250LG 48010020
3 GUARDABELT WING SUIT 2 BARS 48070010
GUARDABELT WING SUIT 3 BARS 48070015
GUARDABELT WING SUIT 4 BARS 48070020
GUARDABELT WING SUIT 5 BARS 48070025
4 CLAMP 48030010
5 MOULDED BAR - 600 LONG 48025008
MOULDED BAR - 900 LONG 48025009
MOULDED BAR - 1200 LONG 48025010
MOULDED BAR - 1400 LONG 48025014
MOULDED BAR - 1500 LONG 48025015
6 GUARDABELT WING SLIDE >350LG 48060010
GUARDABELT WING SLIDE 350-550LG 48060015
GUARDABELT WING SLIDE 550-750LG 48060020
GUARDABELT WING SLIDE >750LG 48060025
7 SCREW M16X50 HEX SET 02315640(gl/ss)
8 BOLT M16X60 HEX 02303614s
9 NUT M16 HEX 02311616(gl/ss)
10 WASHER M16 02319616(gl/ss)
WASHER M16 H/D 02319617g
11 SCREW M12X30 HEX SET 02315530(gl/ss)
12 NUT M12 HEX 02311512(gl/ss)
13 WASHER M12 02319512(gl/ss)
WASHER M12 H/D 02319513g
REQUIRED INFORMATION WHEN ORDERING SPARE PARTS
CLIENT NAME / SITE:
CONVEYOR NUMBER:
ORIGINAL ORDER NUMBER:
DATE SUPPLIED:
ESS SERIAL NUMBER: (ON CRADLE BASE)
CLIENT:
LOCATION:
ESS CAD
JOB No.
REV REVISIONS REF DOCS BY CHKD BY APP BY DATE
A DRAWINGS REVISED H.P. 12/1/93
B CRADLE BASE UPDATED H.P. 9/11/93
C GENERAL REVISION TH TM TT 1/12/96
D REVISED BP SD TT 24/1/03
E UPDATED SD GG TT 12/1/07
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TITLE: GUARDABELT IMPACT CRADLE ASSEMBLY WITH CAST-ON IMPACT BARS EXPLODED PARTS LIST
DRAWN BY: H.POLOI
CHKD: APPD:
SCALE: NTS
DATE: 4/92
DRAWING No. F0055
REV. E
F0039 EXPLODED PARTS - GUARDABELT COMBI CRADLE
F0046 EXPLODED PARTS - GUARDABELT IMPACT CRADLE C/W LEAD ON
F0114 EXPLODED PARTS - GUARDABELT ROLLER CRADLE
DRAWING No. REFERENCE DRAWINGS

FINAL CHECKLIST

Site:_____ Number: _____ Date:_____

Site Equipment No./Location: _____ Site Contact: _____

Completed By: _____ **(Circle Yes or No Below)**

1. **Was equipment to ESS Specification?** _____ **Yes/No**

   Drawing No. Ref: _____ **Attached? Yes/No**

   If No, WHY _____

   _____

   Will this affect performance? Yes/No

   If Yes, WHY _____

   _____

2. **Was this a standard ☐ service ☐ inspection ☐ installation? Yes/No**

   If No, WHY _____

   _____

3. **Was work carried out as per procedure and JSA? Yes/No**

   If No, WHY _____

   _____

4. **Is equipment fit for commissioning? Yes/No**

   If No, WHY _____

   _____

5. **Was a final inspection carried out while plant was running? Yes/No**

   If No, WHY _____

   _____

6. **Has anything changed from previous service / inspection / installation? Yes/No**

   If Yes, WHAT _____

   _____

7. **Is equipment performance to Client expectations? Yes/No**

   If No, WHY _____

   _____

ESS Signature: _____ **Client Signature:** _____